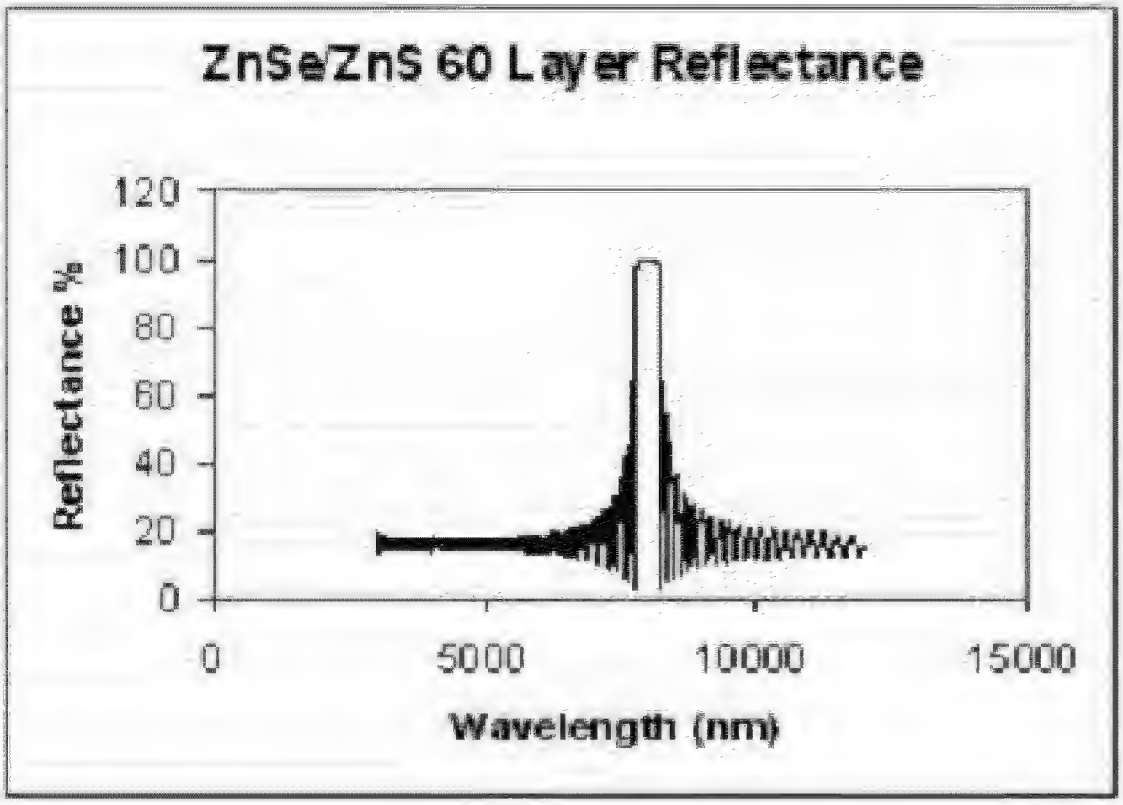
ZnSe/ZnS 60 Layer Reflectance
Reflectance %
120
100
80
60
40
20
0
0
5000
10000
15000
Wavelength (nm)

Fig. 1.

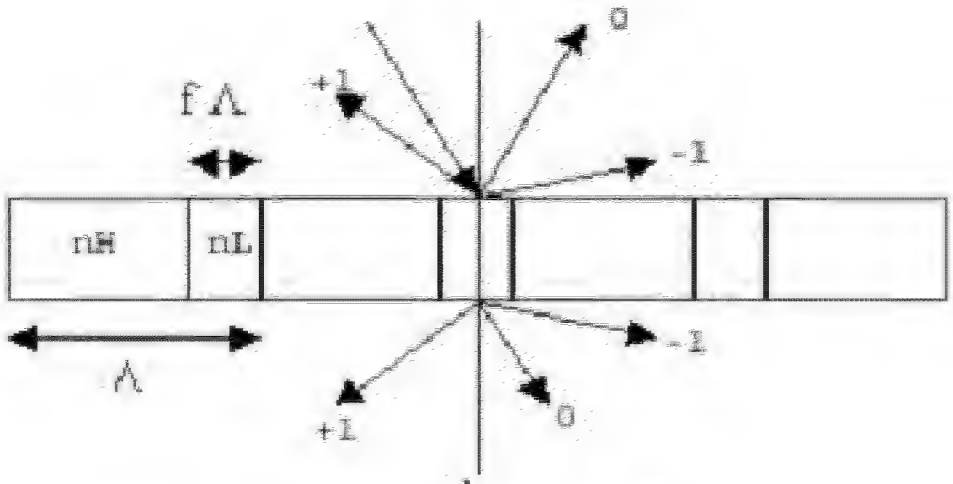

FIG. 2(a)

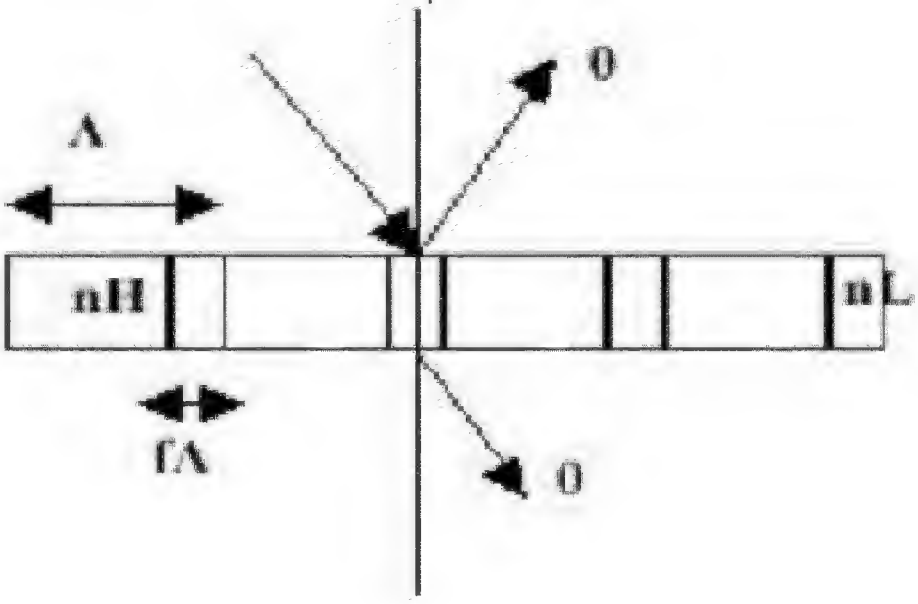

FIG. 2(b)

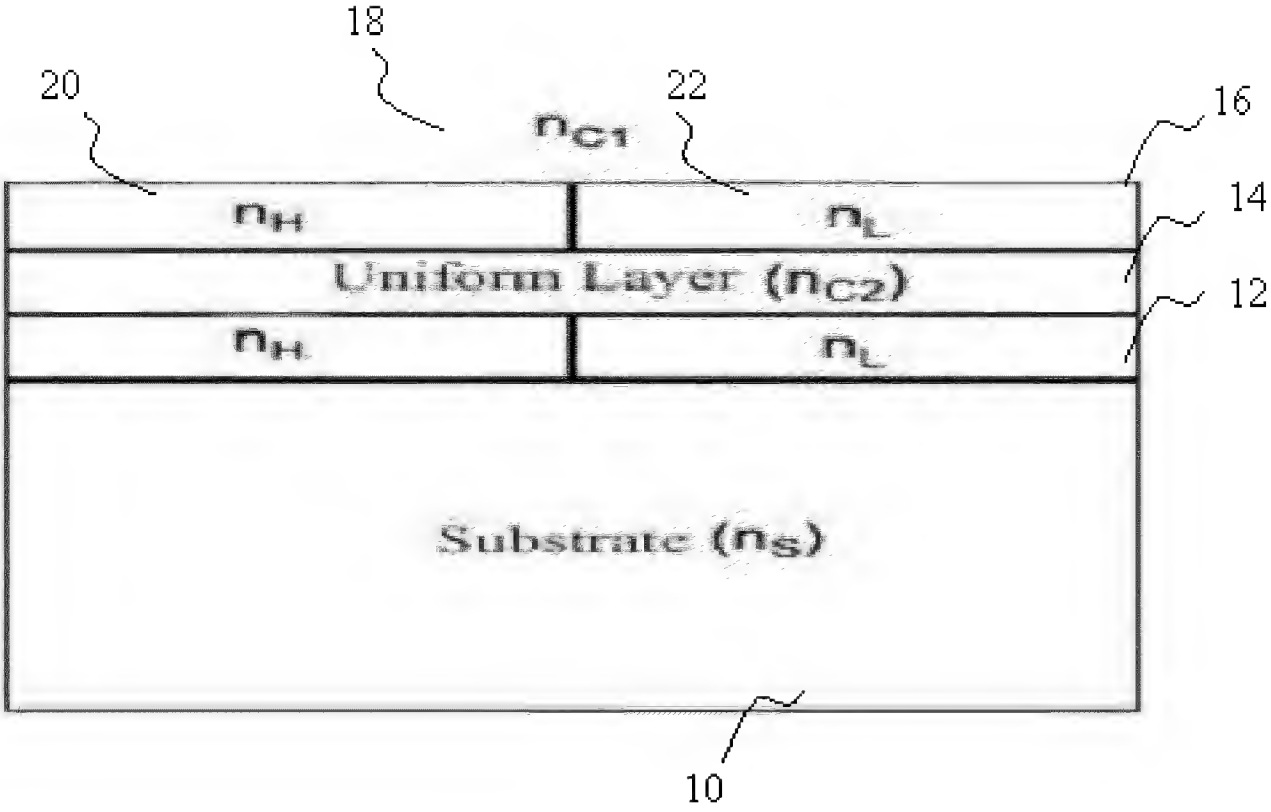
18
20
22
16
n_{C1}
n_H
n_L
14
Uniform Layer (n_{C2})
12
n_H
n_L
Substrate (n_S)
10

Fig. 3.

Table: Materials average refractive index for 3 – 12 μm

Materials	Notation	Refractive index
Barium Fluoride (BaF) (Substrate)	n_S	1.47
Zinc Sulphide (ZnS) (Uniform Layer)	n_{C2} or n_2	2.22
Yittrium Oxide (Y_2O_3) (Low Index Grating Material)	n_L	1.69
Diamond (High Index Grating Material)	n_H	2.37
Air (Superstate)	n_{C1}	1.0

Fig. 4.

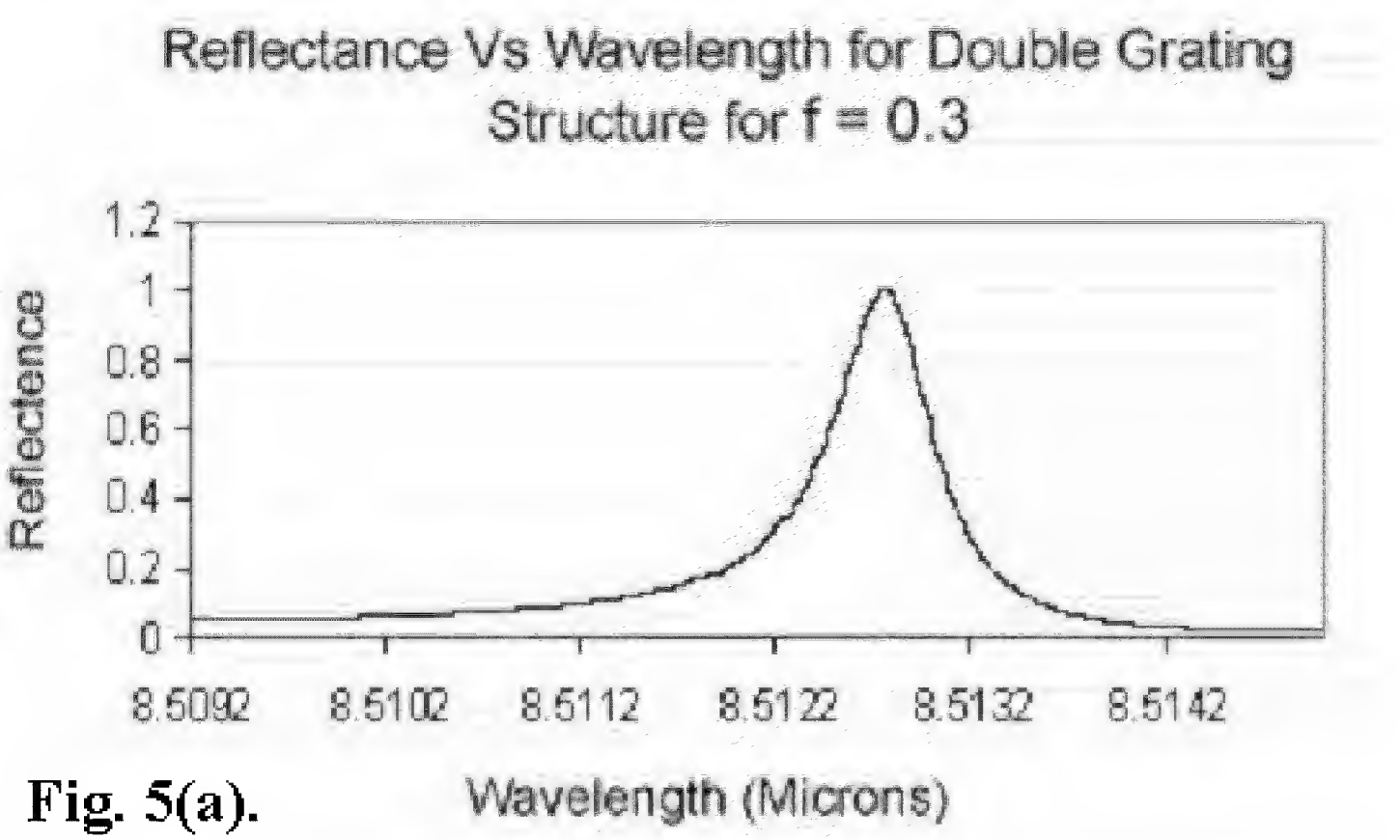
Reflectance Vs Wavelength for Double Grating Structure for f = 0.3
Reflectence
1.2
1
0.8
0.6
0.4
0.2
0
8.5092
8.5102
8.5112
8.5122
8.5132
8.5142
Wavelength (Microns)

Fig. 5(a).

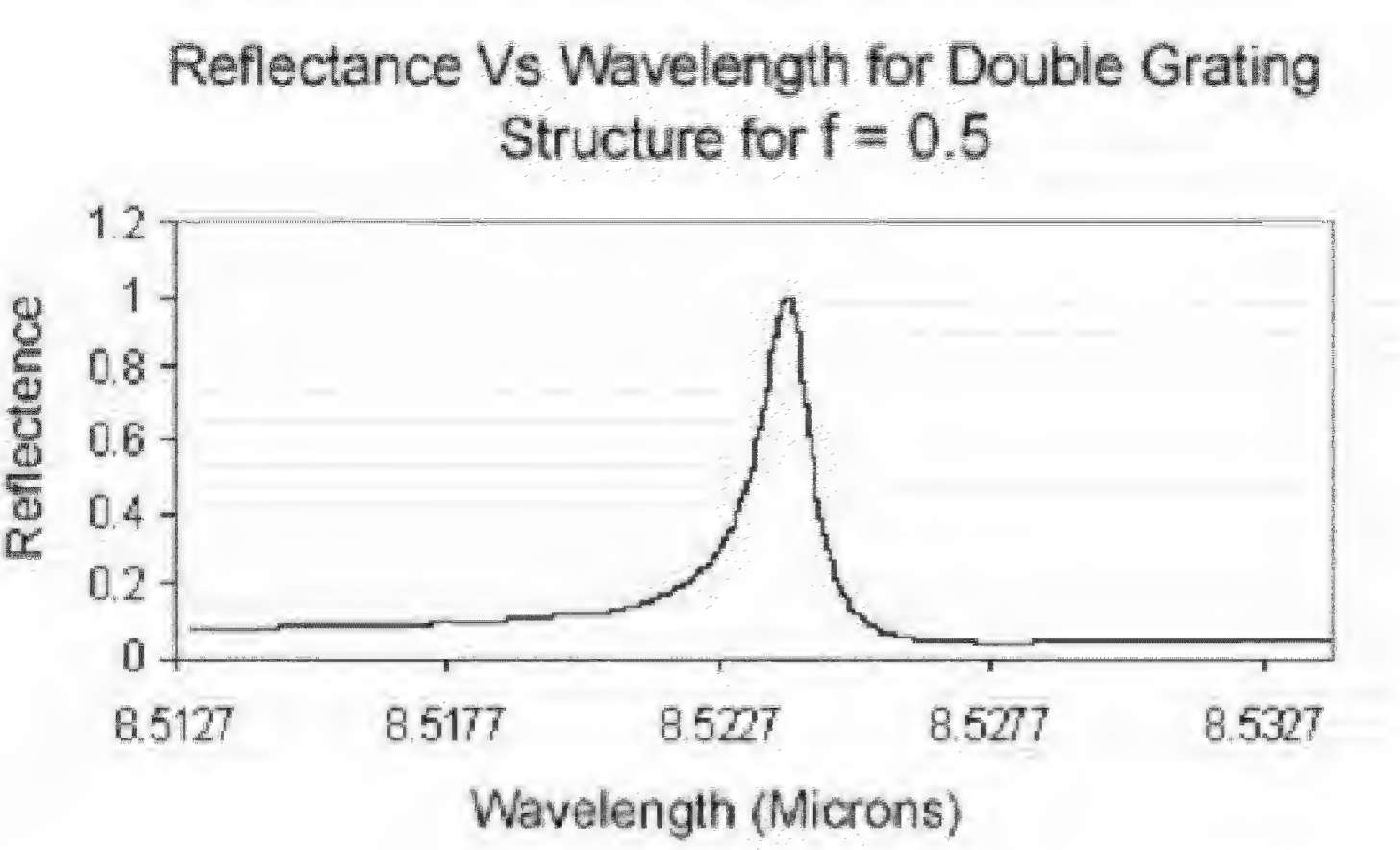
Reflectance Vs Wavelength for Double Grating Structure for f = 0.5
Reflectence
1.2
1
0.8
0.6
0.4
0.2
0
8.5127
8.5177
8.5227
8.5277
8.5327
Wavelength (Microns)

Fig. 5(b).

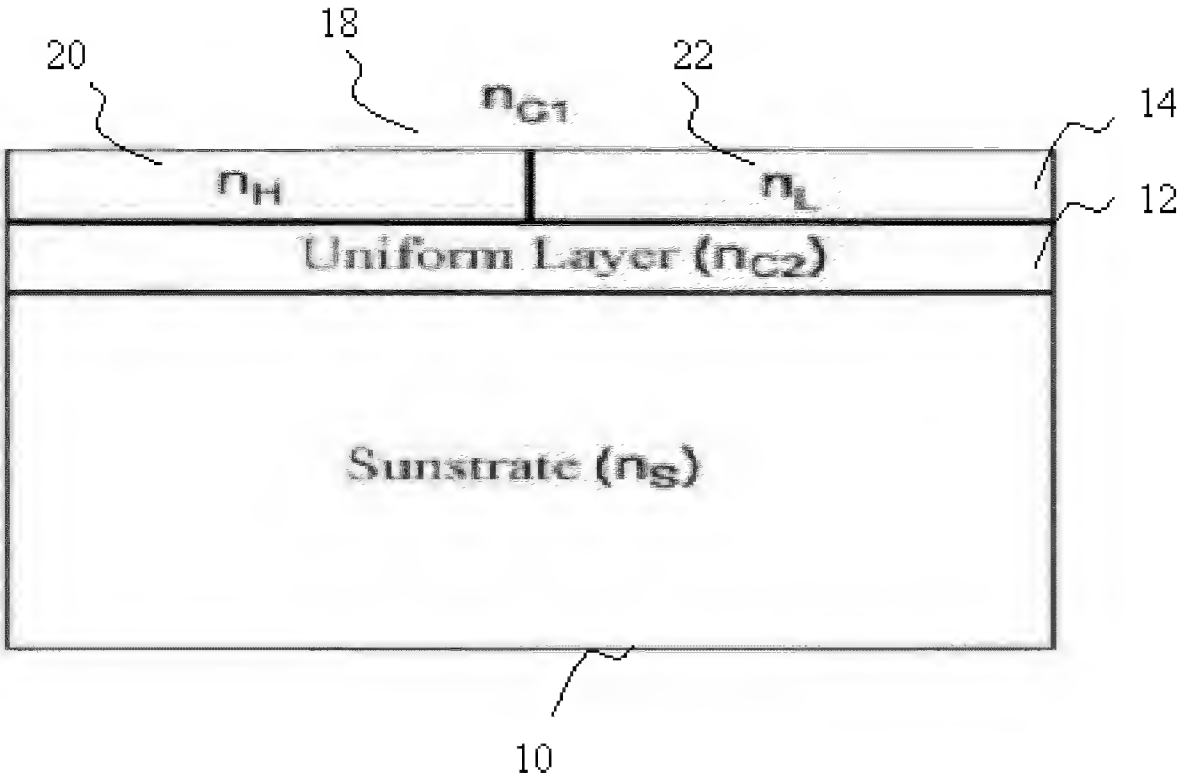

Fig. 6.

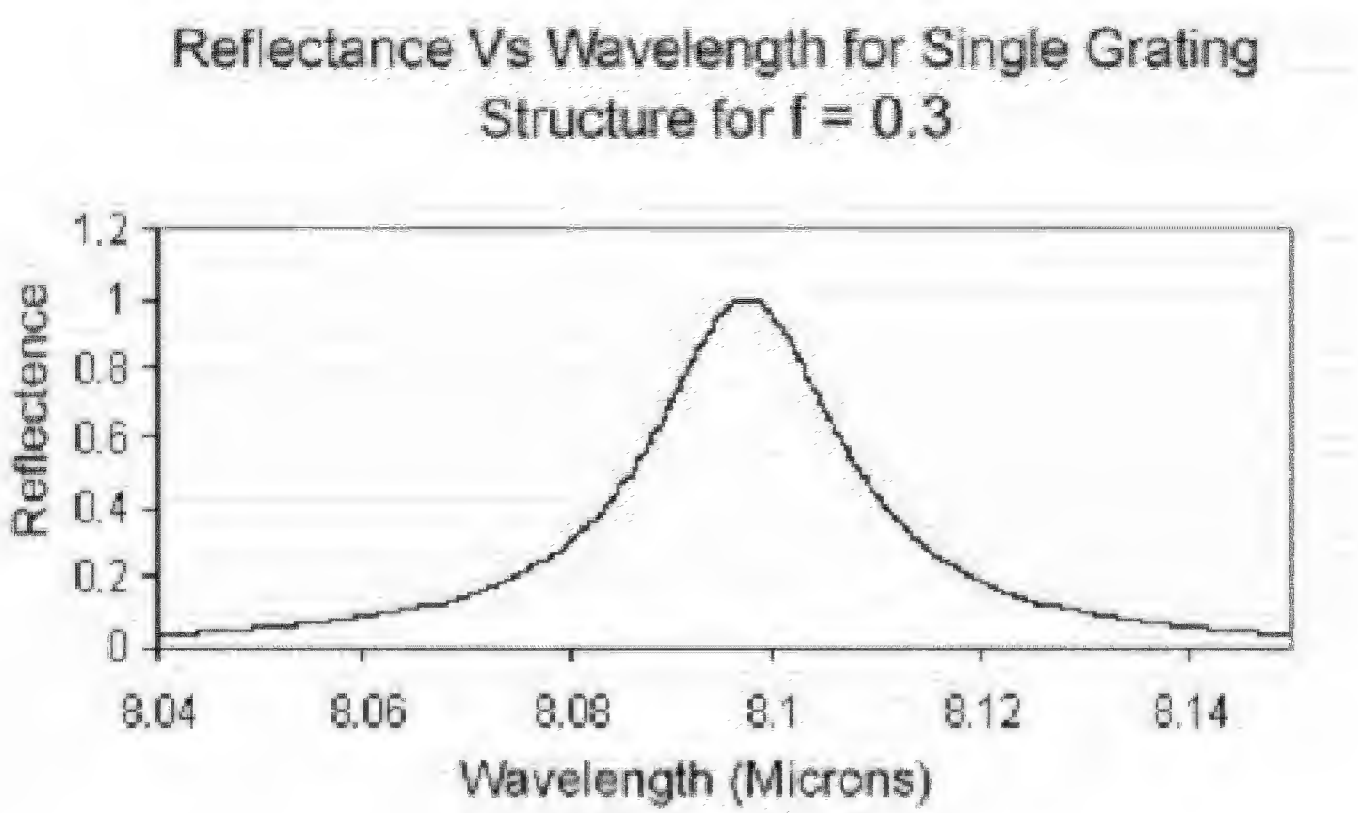
Reflectance Vs Wavelength for Single Grating Structure for f = 0.3
Reflectence
1.2
1
0.8
0.6
0.4
0.2
0
8.04
8.06
8.08
8.1
8.12
8.14
Wavelength (Microns)

Fig. 7(a).

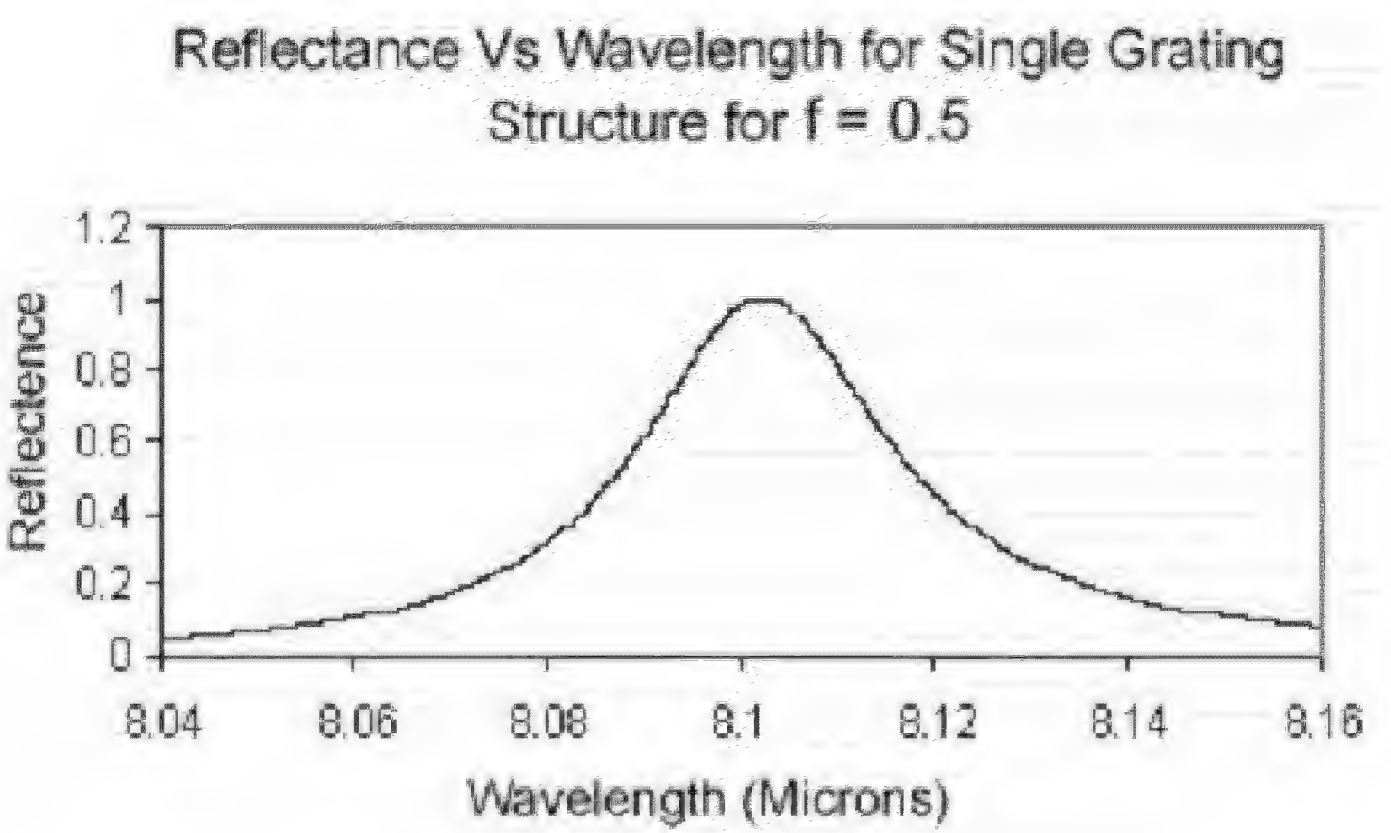
Reflectance Vs Wavelength for Single Grating Structure for f = 0.5
Reflectence
1.2
1
0.8
0.6
0.4
0.2
0
8.04
8.06
8.08
8.1
8.12
8.14
8.16
Wavelength (Microns)

Fig. 7(b).

Table: Performance comparison between proposed and conventional filters

Estimated Performance	Fill Factor 0.5		Fill Factor 0.3		Conventional λ/4 Stacks
	Single Grating	Double Grating	Single Grating	Double Grating	
Peak Wavelength (μm)	8.1022	8.523	8.097	8.512	8
Peak Transmission (%)	>99.99	>99.99	>99.99	>99.99	>99.99
Bandwidth (nm)	31.45	1.211	22.23	0.638	453
Leakage (%)	<2	<3	<2	< 3	40
Grating Spacing (μm)	4.6	4.7	4.6	4.7	-
Thickness (μm)	1.9811	3.0613	2.0191	3.1373	100

Fig. 8.

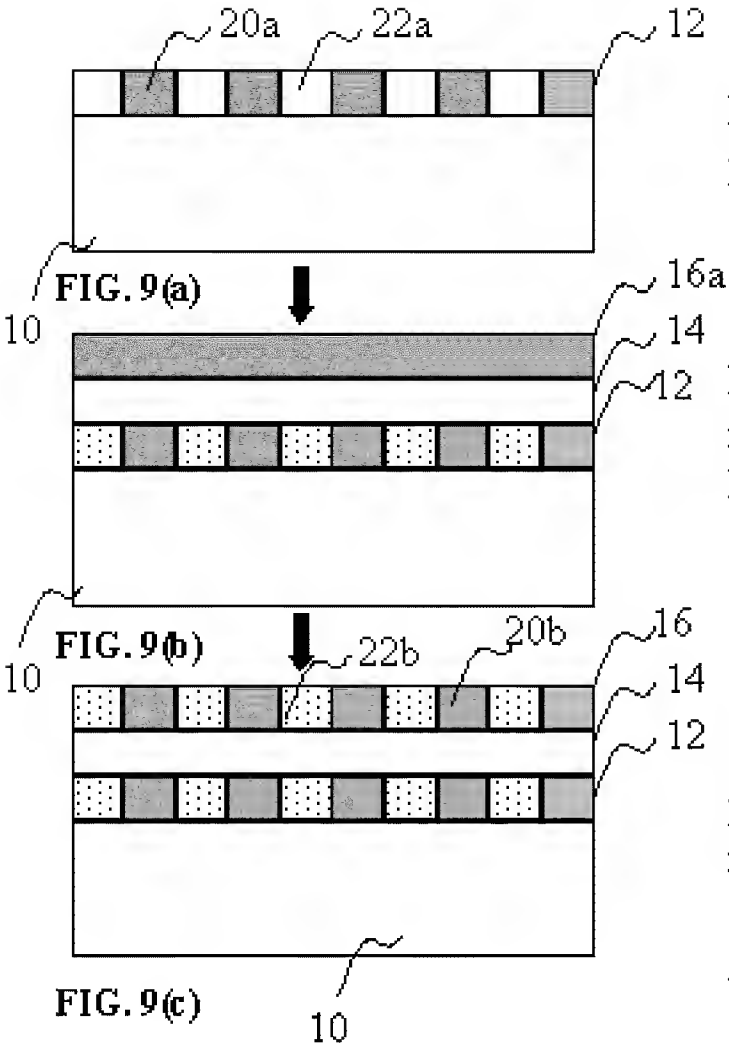

FIG. 9(a)

FIG. 9(b)

FIG. 9(c)

Fig. 9.

High index film deposition, patterning and dry etching

low index film deposition, and making planarization, and uniform layer and high index material deposition

patterning, dry etching, low index film deposition, and planarization

Antireflection coating is deposited on the top of the grating layer

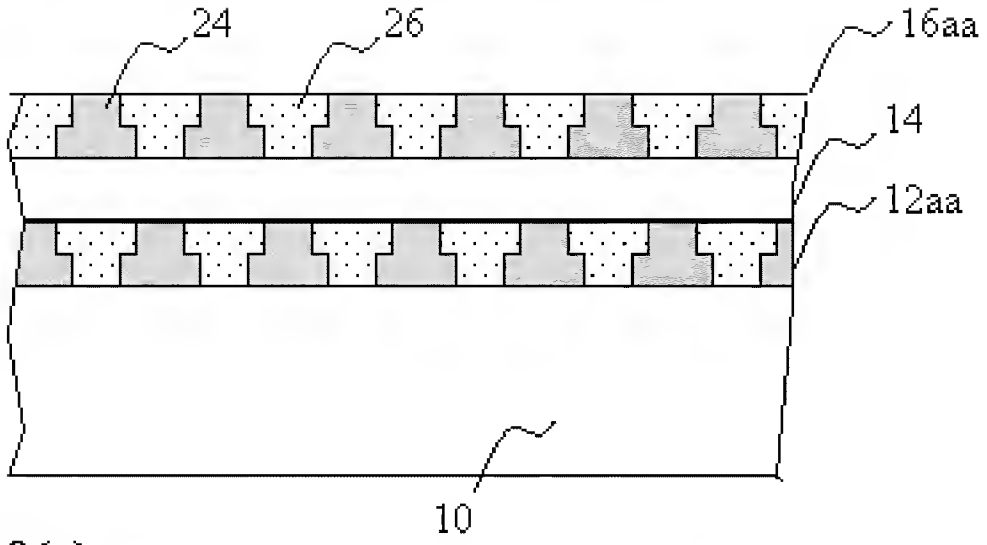

FIG. 10(a)

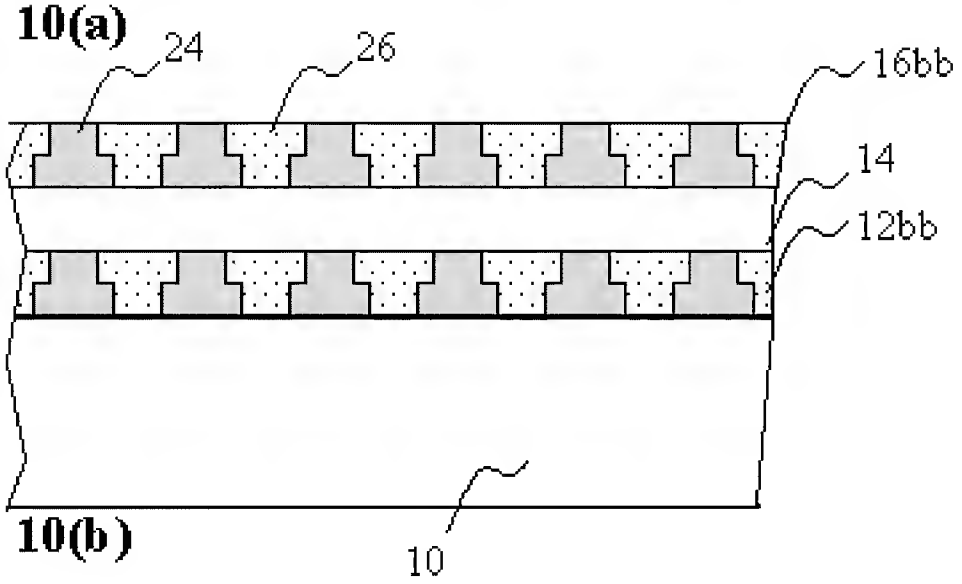

FIG. 10(b)

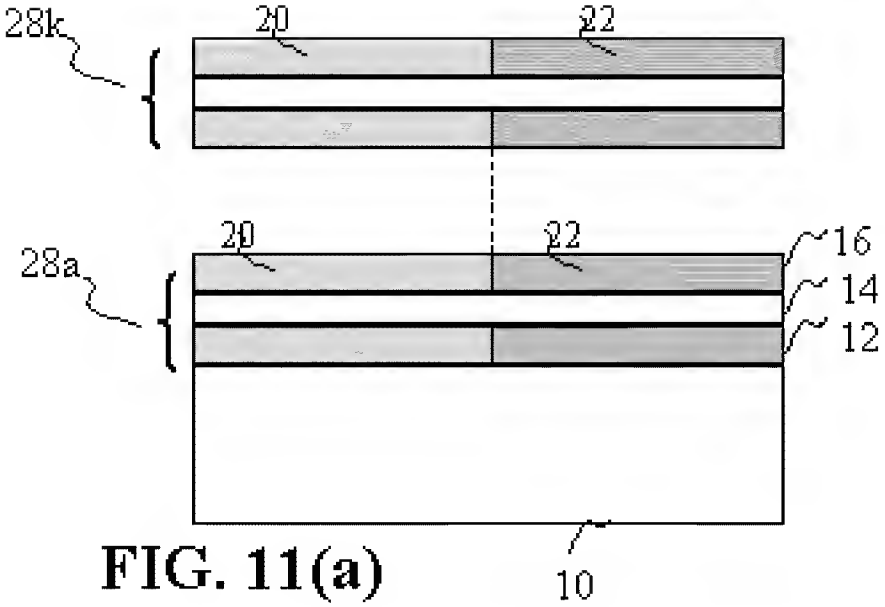

FIG. 11(a)

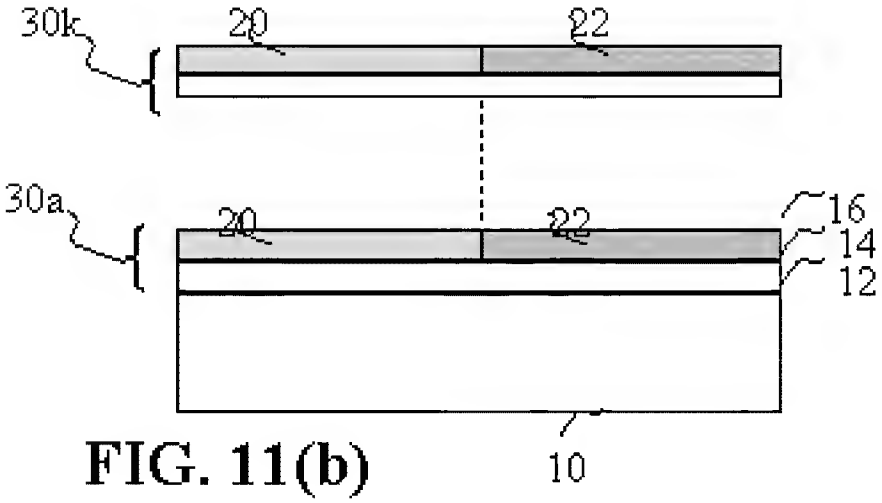

FIG. 11(b)

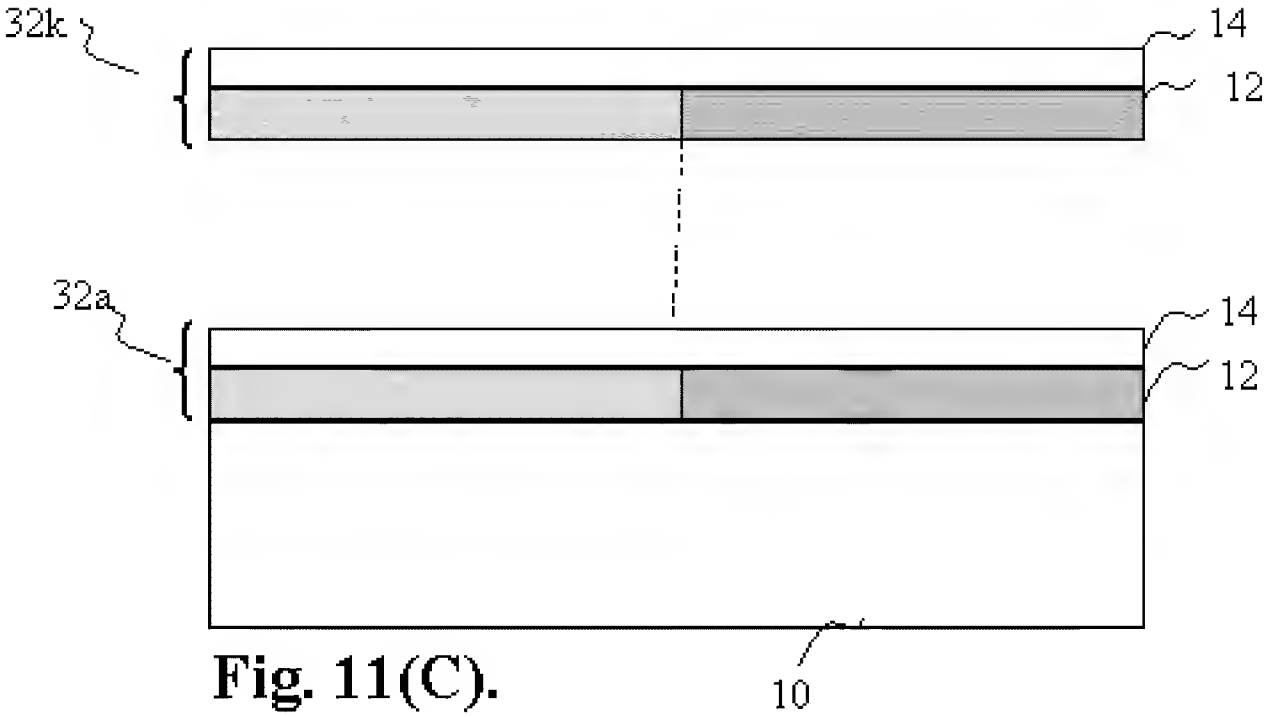

Fig. 11(C).

Fig. 11.

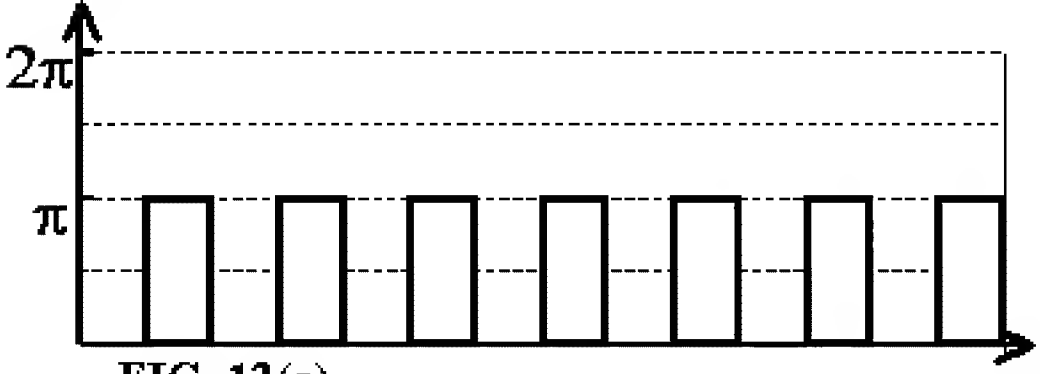

FIG. 12(a)

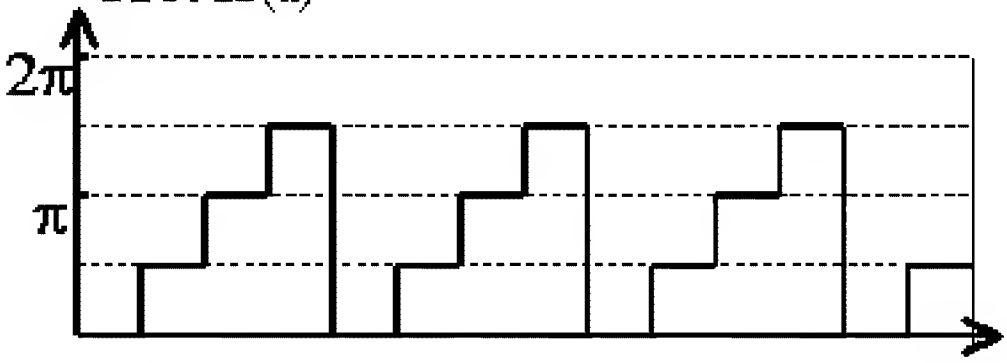

FIG. 12(b)

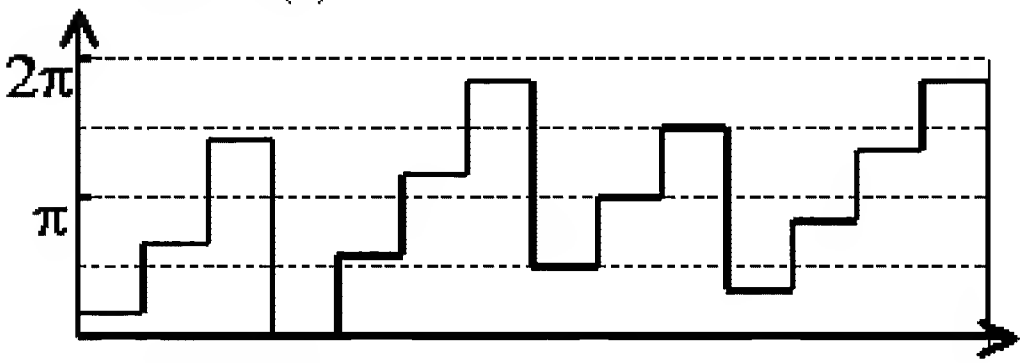

FIG. 12(c)

Fig. 12.